Planned Out-of-Hospital Births in Utah, 2013-2015: A Descriptive Review

Utah Women and Newborns Quality Collaborative (UWNQC),
Out-of-Hospital Birth Subcommittee

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Executive Summary

Key Findings

- More than three percent of the births in Utah are planned to occur in an out-of-hospital setting (home or birth center). The planned out-of-hospital birth rate in Utah is among the top five in the nation.
- Approximately 6.6% of planned out-of-hospital birth attempts in Utah resulted in a transfer to a hospital facility in this study period.
- Some women choosing to deliver at home or in a birth center had obstetric risk factors, including multiple gestation or a history of prior cesarean section.
- Neonatal mortality rates in Utah are higher for planned out-of-hospital births, although small numbers require caution in interpreting these statistics.

Recommendations

- Hospitals and hospital systems should focus on strategies that improve the documentation of maternal and neonatal transfers from an out-of-hospital setting. This will improve assessment of outcomes of planned out-of-hospital births.
- Hospital obstetric and neonatal providers and midwives should be familiar with transfer tools and follow the recommendations in the "Utah Best Practices Guidelines: Transfer to Hospital from Planned Out-of-Hospital Birth" report.

What is New in This Report?

This report is the second in a series of reports on planned out-of-hospital (OOH) births in Utah. This report reviews trends in OOH births and describes maternal and infant outcomes.

The initial report on Utah OOH births, 2010-2012 (https://mihp.utah.gov//wp-content/uploads/Planned_out-of-hospital_births_Utah.pdf), was published in 2016. A critical limitation of this initial report was the inability to identify births that began as a planned home birth but were transferred to a hospital for delivery. In response, the Utah Department of Health added two new fields to the Certificate of Live Birth in 2014. These two fields were a crucial first step to being able to quantify and describe planned home births that transferred to the hospital for delivery. The first field is, "Was mother transferred to a hospital from an attempted planned home birth?" If this is yes, Utah birth certificate clerks then fill in the second field to indicate if the transfer occurred "during labor," "postpartum (within 24 hours of delivery)," or "unknown."

This new report improves on the previous methodology by reporting outcomes of OOH births by planned, rather than actual, place of delivery. This avoids misclassification of intended birth setting and appropriately assigns adverse outcomes to intended location of delivery.

This report also includes newly available information on newborn hearing, critical congenital heart defect, and heel stick screening by delivery setting.

Aims of This Review:

- Describe OOH birth trends in Utah, differentiating home and birth center births, in order to inform health policy and administrative decisions.
- For women who intended to deliver at home or in a birth center, report the rate of maternal and neonatal transfers to a hospital.
- Analyze maternal and neonatal outcomes by intended birth setting.
- Report rates of newborn screening by delivery setting.
- Highlight and publish the work of the Utah Women and Newborns Quality Collaborative (UWNQC) Out-of-Hospital Birth Subcommittee that includes representation from the Utah American College of Nurse-Midwives (ACNM), Utah Midwife Organization (UMO), the Utah American Congress of Obstetricians and Gynecologists (ACOG), administrators from participating hospital and birth center facilities, and the Utah Department of Health.

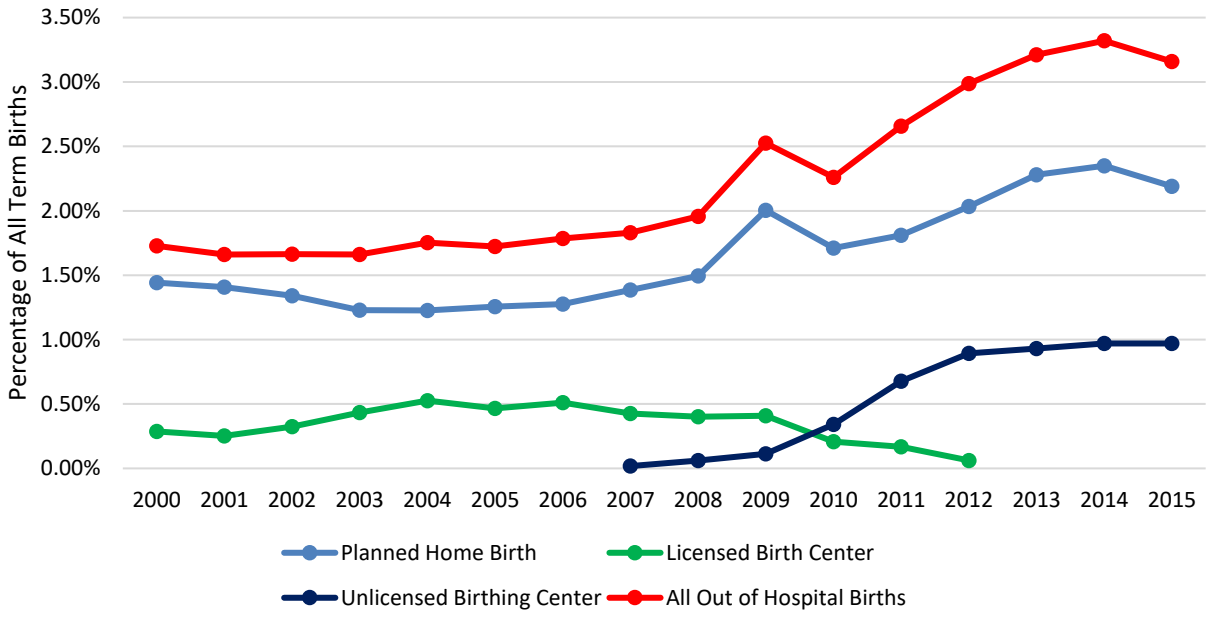
Summary of Report Findings

- In Utah, from 2000 to 2015, planned home births increased by 46% and births at birth centers increased by 339%. The OOH birth rate in Utah was 3.2% in 2015 (2.2% home births, 1% birth center births). Some regions of Utah exceeded an OOH birth rate of 5%. The National Center for Health Statistics reports the home birth rate in Utah was in the top five among U.S. states for each of the years discussed in this report.
- Women who planned OOH births (home or birth center), compared to women who planned hospital births, were more likely to identify as White and non-Hispanic, be at a healthier weight prior to pregnancy, and to have had five or more prior births. Women who planned OOH births were less likely to smoke and were more likely to initiate prenatal care in the second or third trimester.
- Some women who chose to deliver at home or at a birth center had notable obstetric risk factors, including multiple gestation, non-vertex presentation (e.g. breech), or history of prior cesarean delivery.
- From 2014-2015, the overall maternal transfer rate for planned home births in Utah was 6.6%. The intrapartum maternal transfer rate from birth centers was 4.2%. The majority of women (61.8%) transferred to the hospital from a home or birth center had a successful vaginal delivery.
- Rates of neonatal death in Utah were higher for planned OOH births versus hospital births. Caution is necessary in interpreting these statistics due to the overall small numbers of neonatal deaths reported. Nonetheless, these trends are consistent with other reports and warrant continued attention.
- The recommended newborn congenital heart defect screening, hearing screening, and heel stick screening was performed less often for neonates born at home or a birth center.

Background:

The National Center for Health Statistics reports that in 2012, the percentage of OOH births in the U.S. was at the highest level since 1975. (1) In Utah, from 2000 to 2015, planned home birth increased by 46% and births at freestanding birth centers increased by 339% (see Figure 1). The OOH birth rate in Utah was 3.2% in 2015 (2.2% home births, 1% birth center births). Some regions of Utah exceeded an OOH birth rate of 5% (see Figure 2). The National Center for Health Statistics reports the home birth rate in Utah, not distinguishing between planned and unplanned home birth, was in the top five among U.S. states for each of the years discussed in this report. (2-4)

Figure 1. Term Planned Out-of-Hospital Births, Utah, 2000-2015



The only licensed birthing center in Utah closed in 2013. The first unlicensed birthing center opened in 2007. Single room unlicensed birthing centers are exempt from state regulations.

Methods:

This report uses birth certificate and death certificate data collected by the Utah Department of Health, Office of Vital Records and Statistics (OVRS). Data reported include births and deaths, 2013-2015, of Utah residents. Utah newborn screening data are reported from the following: critical congenital heart disease (CCHD) screening data from Utah Department of Health Birth Defect Network Program, hearing data from Utah Department of Health Early Hearing Detection & Intervention Program, and heel stick data from Utah Department of Health Newborn Screening Program.

This report examines recent trends and characteristics of planned OOH births among live, term births (≥37 weeks) without lethal anomalies in Utah. Data from home births that were unplanned or occurred in other locations (ambulance, etc.) were not included in this analysis. Data were analyzed using SAS version 9.2.

A description of the types of birth attendants in Utah can be found at https://mihp.utah.gov/during-pregnancy/choosing-a-prenatal-care-provider. In order to clarify the various types of OOH birth settings for the data presented in this report, definitions are included in the appendix.

This report also contains the addition of a Utah-specific birth certificate variable, implemented in 2014, capturing those who intended to deliver at home but transferred during labor to a hospital for delivery. In this report, data from 2013 are reported using the methodology used in the previous report; data from 2014 and 2015 include the addition of this clarifying variable and will be reported using a new methodology.

For years 2014 and 2015, planned home births ultimately delivering in a hospital setting were placed in the Transfer from Planned OOH Birth to Hospital Birth category. For 2013-2015, births transferred to a hospital from a freestanding birth center were placed in the same category. Reclassifying these deliveries enables us to improve surveillance of outcomes by planned place of delivery.

In each table, births were separated into four mutually exclusive groups; 1) births that occurred in a hospital; 2) planned home births that occurred in a home setting; 3) births that occurred in a birth center; and 4) attempted planned out-of-hospital births that were transferred to a hospital facility for delivery.

Descriptive Statistics:

A total of 138,714 live, term (≥ 37 weeks), non-lethal anomalous infants were born to Utah residents during 2013-2015. The majority of Utah births occurred in hospitals (n=133,853) and were attended by a MD/DO (n=122,087). Table 1 provides an overview of where Utah births occurred, stratified by birth attendant type for 2013-2015. Each birth is counted in only one category. Unplanned home births and births that occurred in other settings, such as a doctor's office, were included in the total births column, but not accounted for separately as they were not planned to occur outside of a hospital; therefore rows will not equal the total.

Table 1. Live term non-lethal anomalous births by planned and actual place of birth and birth attendant, Utah Residents, 2013-2015

Birth Attendant	Total Number of Live Births[#]	Hospitalº	Planned Homeºº	Birth Centerººº	Transfer from Planned Out-of-Hospital Birth to Hospital Birthºººº
State Total	138,714	133,853	3,160	1,338	165
MD/DO	122,087	121,927	0	7*	149
Naturopathic Physician	145	138	7*	0	0
Certified Nurse-Midwife	11,985	11,353	305	308	16
Licensed Direct Entry Midwife	1,562	0	743	806	0
Other Midwife	2,177	0	1,961	208	0
Other	254	**	90	0	0
Out of State Birth - Unknown Attendant	504				

[#]Total births are all births to Utah residents regardless of birth location.
º Births occurring in a licensed hospital.
ºº Planned home births occurring in a home setting.
ººº Births occurring in a single room birth center.
ºººº Births that were planned to happen in a home or birth center but which actually occurred in a hospital after a transfer.
*Use caution in interpreting, the estimate has a coefficient of variation >30% and is therefore deemed unreliable by Utah Department of Health data reporting standards.
**The estimate has been suppressed because 1) The relative standard error is greater than 50% or can't be determined 2) the observed number of events is very small and not appropriate for publication, or 3) it could be used to calculate the number in a cell that has been suppressed.

Non-Utah Residents Delivering in Utah

From 2013-2015, there were 2,918 non-Utah residents who delivered in Utah. The majority of non-resident births were residents of surrounding states; Idaho, Wyoming, Nevada, and Arizona. Among these births, 96.1% occurred in a hospital, 2.6% in a birth center, and 1.1% in a planned home birth setting.

Figure 2 and Figure 3 describe where OOH births occurred in Utah during 2013-2015. Figure 2 depicts the rates of OOH births in Utah by the mother's local health district of residence. The highest rate of OOH births during these years occurred among women residing in the Central Utah Health District, comprised of Juab, Millard, Sanpete, Sevier, Piute, and Wayne counties. Figure 3 depicts the percentage distribution based on the population as a whole and is reflective of where the highest population in the state resides, in the Utah and Salt Lake County health districts.

Geographic Distribution

Figure 2. Percentage of live term non-lethal anomalous births that occurred at home or birth center, by local health district, 2013-2015

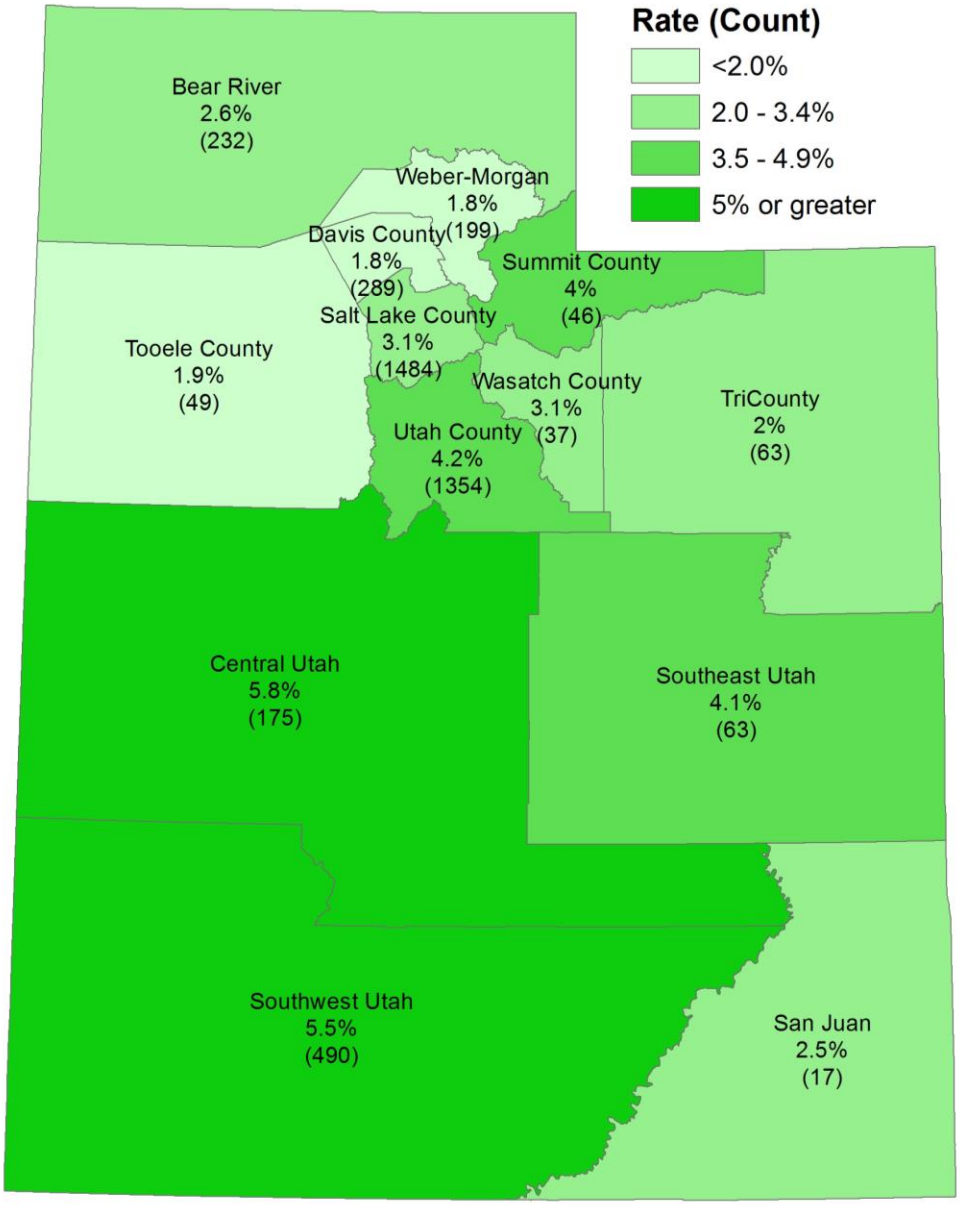
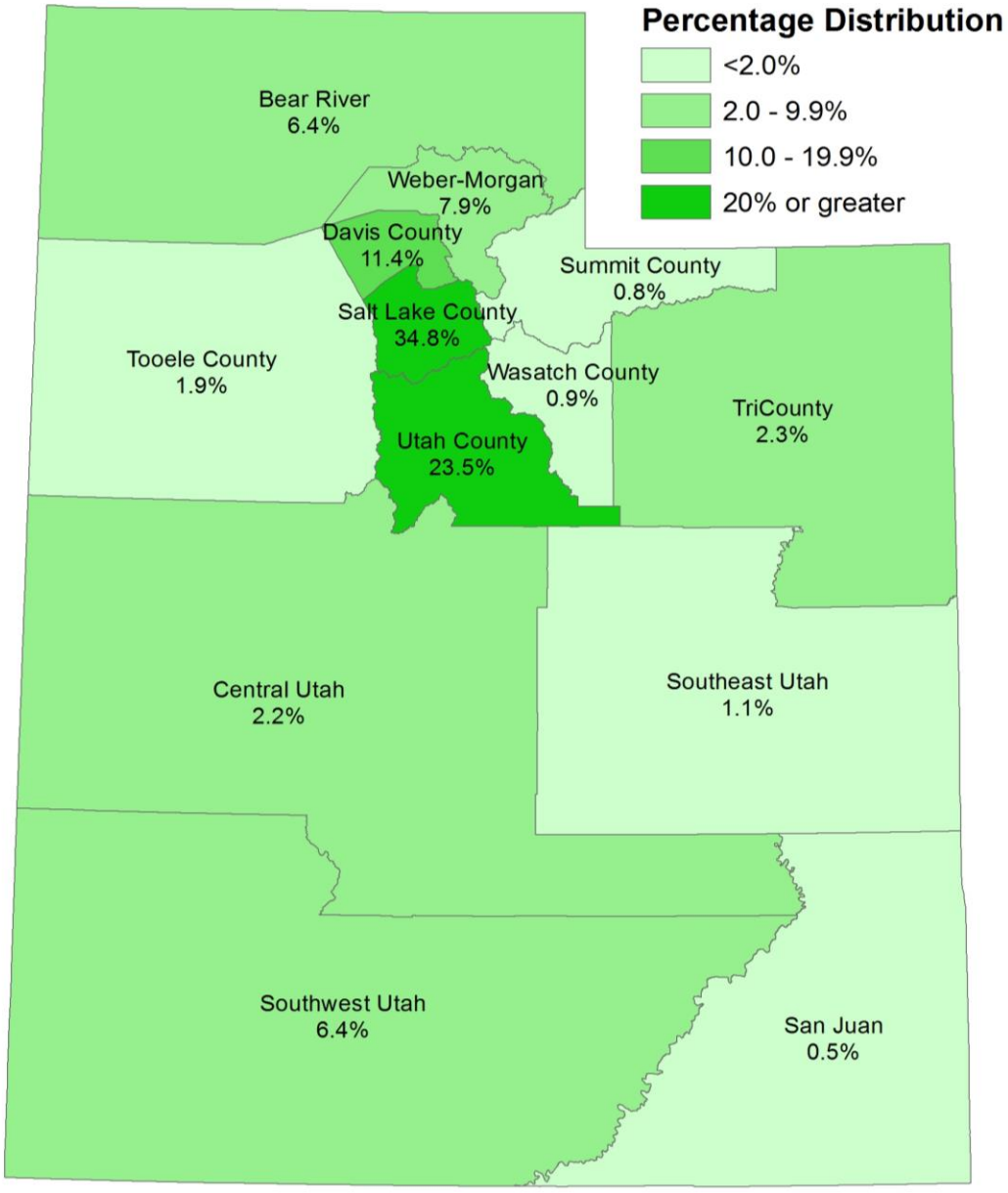


Figure 3. Distribution of live term non-lethal anomalous OOH births by local health district, 2013-2015



Demographic and Medical Characteristics

Women who planned OOH births (home or birth center), compared to women who planned hospital births, were more likely to identify as White and non-Hispanic. Women having births in the OOH setting were also more likely to be at a normal weight prior to pregnancy, have had five or more prior births, report lower smoking rates, and initiate prenatal care in the second or third trimester. Women planning a home birth were more likely to be 35 years of age or older and living in a rural area of the state. Women planning a birth center delivery were very similar to the planned hospital delivery group with the exception of being more likely to be married. See Table 2 for more detailed information on maternal demographic characteristics.

Table 2. Maternal characteristics of live term non-anomalous births by planned place of birth, Utah residents, 2013-2015

Characteristic	Total Births^	Hospitalº		Planned Homeºº		Birth Centerººº		Transfer from Planned Out-of-Hospital Birth to Hospital Birthºººº	
		Number	%	Number	%	Number	%	Number	%
Total Term Non-Anomalous Births									
	138,714	133,853		3,160		1,338		165	
Mother's Age									
<20	5,791	5,665	4.2	105	3.3	13	1.0	*	*
20-24	30,426	29,565	22.1	536	17.0	263	19.7	33	20.4
25-29	47,364	45,800	34.3	921	29.2	521	39.0	52	32.1
30-34	37,249	35,743	26.7	1,010	32.1	384	28.7	52	32.1
35-39	15,195	14,529	10.9	486	15.4	135	10.1	15	9.3
40+	2,478	2,355	1.8	92	2.9	21	1.6	7*	4.3*
Mother's Race									
White	127,866	123,161	92.0	3,069	97.1	1,303	97.4	155	93.9
Black	1,791	1,764	1.3	14	0.4	8*	0.6*	**	**
American Indian	1,656	1,638	1.2	8*	0.3*	5*	0.4*	**	**
Asian	3,094	3,061	2.3	21	0.7	8*	0.6*	**	**
Hawaiian/PI	1,737	1,727	1.3	6*	0.2*	**	**	**	**
Other	730	709	0.5	15	0.5	5*	0.4*	**	**
Unknown	1,833	1,786	1.3	27	0.9	7*	0.5*	**	**
Mother's Education									
Less Than High School	12,985	12,745	9.5	179	5.7	22	1.6	9*	5.5*
High School Graduate	25,764	25,002	18.7	567	17.9	137	10.2	25	15.2
Some college	52,045	50,029	37.4	1,353	40.9	547	42.8	60	36.4
College Graduate	44,494	42,732	31.9	1,011	46.0	616	32.0	65	39.4
Unknown	3,425	3,344	2.5	50	1.6	16	1.2	6*	3.6*
Hispanic Ethnicity									
No	113,885	109,327	81.9	3,012	95.5	1,247	93.8	147	89.1
Yes	20,812	20,587	15.4	111	3.5	75	5.6	9*	5.5
Unknown	3,561	3,506	2.6	31	1.0	7*	0.5*	9*	5.4

Table 2. Maternal characteristics of live term non-anomalous births by planned place of birth, Utah residents, 2013-2015 (continued)

Characteristic	Total Births^	Hospitalº		Planned Homeºº		Birth Centerººº		Transfer from Planned Out-of-Hospital Birth to Hospital Birthºººº	
		Number	%	Number	%	Number	%	Number	%
Marital Status									
Married	112,709	108,468	81.1	2,694	85.3	1,257	94.0	142	86.1
Unmarried	25,946	25,326	18.9	466	14.7	81	6.0	23	13.9
Initiation of Prenatal Care									
1st Trimester	106,177	103,534	78.3	1,627	52.5	809	61.7	96	61.5
2nd Trimester	22,463	20,863	15.8	1,155	37.3	354	27.0	46	29.5
3rd Trimester	3,681	3,399	2.6	185	6.0	81	6.2	6*	3.9*
No Care	468	399	0.3	48	1.6	**	**	6*	3.9*
Unknown	4,176	4,022	3.0	83	2.7	65	5.0	**	**
Pre-Pregnancy Body Mass Index									
Underweight	6,132	5,864	4.4	182	5.9	71	5.4	7*	4.4*
Normal	73,604	70,524	53.3	2,013	65.5	862	66.0	96	59.6
Overweight	31,353	30,414	23.0	590	19.2	262	20.0	44	27.3
Obese	25,957	25,517	19.3	288	9.4	112	8.6	14	8.7
Smoked in Last Trimester									
No	134,881	130,045	97.2	3,150	99.7	1,333	99.6	165	100
Yes	3,833	3,808	2.8	10*	0.3*	5*	0.4*	0	
Number of Previous Live Births									
No prior births	44,515	43,054	32.5	490	15.5	410	30.6	100	60.6
1-5 prior births	92,025	88,592	66.2	2,295	72.6	905	67.6	54	32.7
6 + prior births	2,174	1,757	1.3	375	11.9	23	1.7	11*	6.7*
Residence									
Urban	107,140	103,588	77.4	2,228	70.5	1,085	81.1	92	55.8
Rural	31,574	30,265	22.6	932	29.5	253	18.9	73	44.2

^Total births reflects all live term non-anomalous births to Utah residents regardless of location.
º Births occurring in a licensed hospital.
ºº Planned home births occurring in a home setting.
ººº Births occurring in a single room birth center.
ºººº Births that were planned to happen in a home or birth center but which actually occurred in a hospital after a transfer.
*Use caution in interpreting, the estimate has a coefficient of variation > 30% and is therefore deemed unreliable by Utah Department of Health standards.
**The estimate has been suppressed because 1) The relative standard error is greater than 50% or when the relative standard error can't be determined or 2) the observed number of events is very small and not appropriate for publication.

Among women with a planned OOH birth, several pregnancy risk factors were notable. Among planned home births, 0.6% were multiple gestation deliveries. Among planned home and birth center births, 0.5% were in non-vertex (e.g. breech) presentation and 2.8% of women had a vaginal birth after cesarean (VBAC). See Table 3 for more detailed information on maternal and infant medical conditions and labor and delivery characteristics.

Table 3. Maternal conditions, characteristics of labor and delivery, and infant conditions of live term non-anomalous births by planned place of birth, Utah residents, 2013-2015

Characteristic	Total Births^	Hospitalº		Planned Homeºº		Birth Centerººº		Transfer from Planned Out-of-Hospital Birth to Hospital Birthºººº	
		Number	%	Number	%	Number	%	Number	%
Total Term Non-Anomalous Births									
	138,714	133,853		3,160		1,338		165	
Maternal Conditions									
Multiple Gestation	2,041	2,017	1.5	20	0.6	**	**	**	**
Gestational Diabetes	6,600	6,582	4.9	6*	0.2*	**	**	**	**
Diabetes-Chronic	1,203	1,179	0.9	7*	0.2*	9*	0.7*	**	**
Hypertension-Chronic	1,402	1,399	1.1	**	**	**	**	**	**
Hypertension-Gestational	6,279	6,266	4.7	**	0**	**	**	**	**
Group B Strep^^	26,628	26,073	19.5	250	7.9	243	18.2	33	20.0
Maternal transfusion	751	732	0.6	11*	0.4*	5*	0.4*	**	**
3rd or 4th degree perineal laceration	1,680	1,645	1.2	21	0.7	8*	0.6*	**	**
Ruptured uterus	26	26	0.02	**	**	**	**	**	**
Admission to ICU	95	92	0.07	**	**	**	**	**	**
Unplanned Operative Procedure	312	291	0.2	11*	0.4*	7*	0.5*	**	**
Characteristics of Labor and Delivery									
Premature rupture of membranes	661	552	0.4	57	1.8	45	3.4	**	**
Precipitous labor	1,883	1,402	1.1	334	10.6	92	6.9	**	**
Prolonged labor	823	711	0.5	69	2.2	21	1.6	21	12.7
Non-Vertex presentation	1,319	1,293	1.0	19	0.6	5*	0.4*	**	**
Moderate/Heavy meconium staining	3,636	3,574	2.7	34	1.1	14	1.1	12	7.3
Fetal intolerance of labor	8,356	8,299	6.2	15	0.5	6*	0.5*	36	21.8
Chorioamnionitis	4,346	4,323	3.2	**	**	**	**	20	12.1
Induction of labor	21,620	21,563	16.1	12	0.4	41	3.1	**	**
Augmentation of labor~	40,174	39,989	29.9	55	1.7	69	5.2	61	37.0
Epidural/spinal anesthesia	115,989	115,858	86.6	0	0	**	**	128	77.6

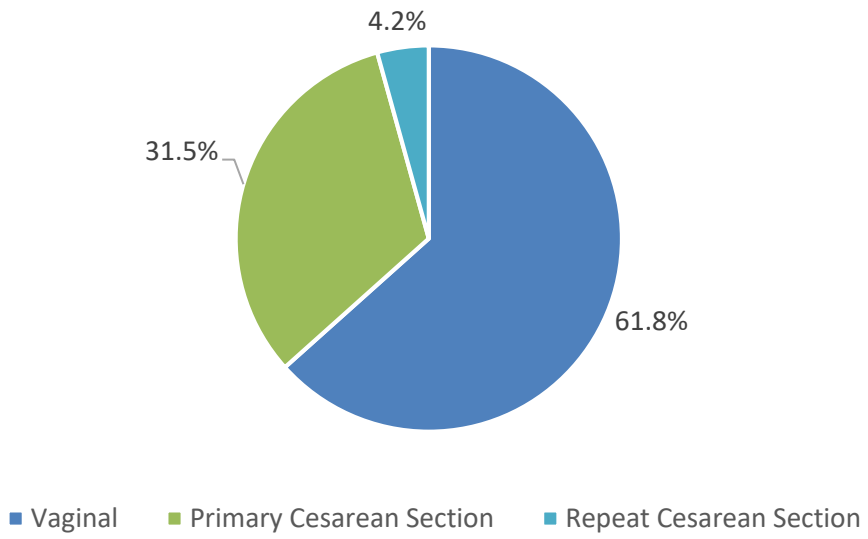
Table 3. Maternal conditions, characteristics of labor and delivery, and infant conditions of live term non-anomalous births by planned place of birth, Utah residents, 2013-2015 (continued)

Characteristic	Total Births^	Hospitalº		Planned Homeºº		Birth Centerººº		Transfer from Planned Out-of-Hospital Birth to Hospital Birthºººº	
		Number	%	Number	%	Number	%	Number	%
Method of Delivery									
Vaginal	107,666	103,054	77.0	3,017	97.0	1,306	97.6	102	61.8
Vaginal birth after Cesarean section	2,853	2,711	2.0	95	3.0	32	2.4	**	**
Primary Cesarean section	18,428	18,376	13.7	0	0	0	0	52	31.5
Repeat Cesarean section	9,716	9,709	7.3	0	0	0	0	7*	4.2*
Infant Conditions									
Immediate Assisted ventilation♯	4,762	4,627	3.5	51	1.6	66	4.9	17	10.3
Assisted ventilation 6+ hours##	1,623	1,600	1.2	10*	0.3*	7*	0.5*	**	**
Neonatal transfer	1,036	959	0.7	37	1.2	29	2.2	**	**
NICU Admission of 24+ Hours	6,898	6,852	5.1	13	0.4	6*	0.5*	15	9.1
Surfactant therapy	419	413	0.3	**	**	**	**	**	**
Antibiotics	7,741	7,691	5.8	13	0.4	**	**	21	12.7
Seizure	70	64	0.05	**	**	0	0	**	**

^Total births reflects all live term non-anomalous births to Utah residents regardless of location.
º Births occurring in a licensed hospital.
ºº Planned home births occurring in a home setting.
ººº Births occurring in a single room birth center.
ºººº Births that were planned to happen in a home or birth center but which actually occurred in a hospital after a transfer.
*Use caution in interpreting, the estimate has a coefficient of variation > 30% and is therefore deemed unreliable by Utah Department of Health standards.
**The estimate has been suppressed because 1) The relative standard error is greater than 50% or when the relative standard error can't be determined or 2) the observed number of events is very small and not appropriate for publication.
♯ Infant given manual breaths for any duration with bag and mask or bag and endotracheal tube within the first several minutes from birth.
##Infant given mechanical ventilation (breathing assistance) by any method for > 6 hours including conventional, high frequency and/or continuous positive pressure (CPAP).
^^ The lower rates of Group B Strep among home births may be attributed to non-testing.
~Augmentation of Labor defined as: Stimulation of uterine contractions by drug or manipulative technique with the intent to reduce the time to delivery.
Induction of labor: Initiation of uterine contractions by medical and/or surgical means for the purpose of delivery before the spontaneous onset of labor.
Epidural/Spinal Anesthesia: Administration to the mother of a regional anesthetic for control of the pain of labor, i.e., delivery of the agent into a limited space with the distribution of the analgesic effect limited to the lower body.

Figure 4 illustrates the delivery method among women transferred from planned out-of-hospital birth to a hospital. It is important to note that the majority of women (61.8%) transferred to a hospital from a home or birth center had a successful vaginal delivery.

Figure 4. Delivery method among women transferred from planned out-of-hospital birth to hospital for birth, 2013-2015



Newborn Screening

Newborn screening aims to identify newborns who may be at risk for hidden conditions. If left untreated, these conditions can lead to illness, physical disability, developmental delay, or death. A screening test is not a diagnostic test. It identifies individuals who may have a condition so that follow-up testing can be offered to determine if the condition is truly present.

There are three parts to newborn screening: 1) a heel stick to collect a small blood sample, 2) pulse oximetry to look at the amount of oxygen in the baby's blood, and 3) a hearing screen. Utah Statute 26-10-6 currently mandates all three components of newborn screening, regardless of maternal residency, except in the case "where parents object because they are members of a specified, well-recognized religious organization whose teachings are contrary to the tests required by this section."

Table 4 presents newborn screening testing by planned place of birth. Data for newborn screening represents Utah residents delivering in Utah. Denominator data for each newborn screening program for this report used a different time period according to available data.

Screening for critical congenital heart defects by pulse oximetry was lower in planned home and birth center births. For newborn hearing screening, rates were lowest among planned home births. For newborn heel stick screening, 29.0% of infants born at home were either not screened or their parents declined screening; this percentage is 8.4% in birth center births and less than one-tenth of a percent in hospital births.

Table 4. Newborn Screening Testing of live term non-anomalous births by planned place of birth, Utah residents delivering in Utah

Characteristic	Total Births~	Hospitalº		Planned Homeºº		Birth Centerººº		Transfer from Planned Out-of-Hospital Birth to Hospital Birthºººº	
		Number	%	Number	%	Number	%	Number	%
Newborn Screening, Critical Congenital Heart Defect (CCHD) Screening by Pulse Oximetry, Total Term Non-Anomalous Births, October 2014 – December 2015									
Total Births	56,972	55,002		1,251		547		90	
CCHD Screening by Pulse Oximetry									
Not Screened	2,203	1,830	3.3	241	19.3	114	20.8	12	13.3
Declined Screening	94	**	**	85	6.8	**	**	**	**
Newborn Screening, Hearing Screening, Total Term Non-Anomalous Births, 2015									
Total Births	45,870	44,272		1,009		446		77	
Hearing Screening									
Not Screened	168	27	0.1	133	13.2	8*	1.8	**	**
Declined Screening	105	35	0.1	55	5.5	9*	2.0	6*	7.8
Newborn Screening, Heel stick Screening, Total Term Non-Anomalous Births, 2013-2015									
Total Births	138,210	133,420		3,106		1,329		165	
Heel stick Screening									
Not Screened	447	79	0.06	324	10.4	40	3.0	**	**
Declined Screening	695	34	0.03	578	18.6	72	5.4	9*	5.5*
Newborn Screening, Heel stick Screening Completed and Number of Specimens Completed, Total Term Non-Anomalous Births, 2013-2015^^									
Total Births Screened	137,042	133,284		2,203		1,216		151	
Number of Specimens Received									
1 Specimen Only	4,858	4,179	3.1	510	23.2	136	11.2	21	13.9
More than One Specimen	132,184	129,105	96.9	1,693	76.8	1,080	88.8	130	86.1
Newborn Screening, Heel Stick Screening Completion Time, Total Term Non-Anomalous Births, 2013-2015^^									
Total Births Screened	137,042	133,284		2,203		1,216		151	
Heel Stick Screening Completion Time									
Less than 6 Days after birth	134,619	131,778	98.9	1,506	68.4	1,015	83.5	142	94.0
6 Days or More after birth	2,423	1,506	1.1	697	31.6	201	16.5	9*	6.0*

~Total births reflects all live term non-anomalous births to Utah residents delivering within the State of Utah.
º Births occurring in a licensed hospital.
ºº Planned home births occurring in a home setting.
ººº Births occurring in a single room birth center.
ºººº Births that were planned to happen in a home or birth center but which actually occurred in a hospital after a transfer.
*Use caution in interpreting, the estimate has a coefficient of variation > 30% and is therefore deemed unreliable by Utah Department of Health standards.
**The estimate has been suppressed because 1) The relative standard error is greater than 50% or when the relative standard error can't be determined or 2) the observed number of events is very small and not appropriate for publication.
^^Total numbers exclude those who declined screening or were not screened.

Out-of-Hospital Birth to Hospital Transfer

From 2014-2015, where transfer data was complete for both years, there were 149 maternal transfers from a planned home birth attempt to a hospital. Among these planned home birth transfers, 75.2% occurred in the intrapartum period (during labor) and 24.8% were transferred postpartum. In this same time period, there were 40 intrapartum transfers from a birth center to a hospital (data on postpartum transfer from birth centers is not available).

From 2014-2015, the overall maternal transfer rate (intrapartum and postpartum) among planned home births was 6.6%. The intrapartum transfer rate from planned home births was 5.1%. The intrapartum transfer rate from birth centers was 4.2%. The total intrapartum transfer rate for all OOH birth attempts was 4.8%.

Table 5. Term non-lethal anomalous neonatal deaths (0-28 days) by planned place of birth, Utah residents, 2013-2015

Hospital		Planned Out-of-Hospital	
Number	**Rate per 1,000 live births**	**Number**	**Rate per 1,000 live births**
70	0.52 (95% C.I. 0.4-0.7)	9*	1.93 (95% C.I. 0.66-3.19)

*Use caution in interpreting, the estimate has a coefficient of variation > 30% and is therefore deemed unreliable by Utah Department of Health standards.

Table 6. Term non-lethal anomalous neonatal deaths (0-28 days) by specific planned place of birth, Utah residents, 2013-2015

Hospitalº		Planned Homeºº		Birth Centerººº		Transfer from Planned Out-of-Hospital Birth to Hospital Birthºººº	
Number	**Rate per 1,000 live births**	**Number**	**Rate per 1,000 live births**	**Number**	**Rate per 1,000 live births**	**Number**	**Rate per 1,000 live births**
70	0.52 (95% C.I. 0.4-0.7)	4*	1.27 (95% C.I. 0.03-2.5)	2*	1.5 (95% C.I. 0-3.6)	3*	18.29 (95% C.I. 0.0-38.7)

º Births occurring in a licensed hospital.
ºº Planned home births occurring in a home setting.
ººº Births occurring in a single room birth center.
ºººº Births that were planned to happen in a home or birth center but which actually occurred in a hospital after a transfer.
*Use caution in interpreting, the estimate has a coefficient of variation > 30% and is therefore deemed unreliable by Utah Department of Health standards.

Perinatal Mortality Review Committee

The Utah Department of Health Perinatal Mortality Review (PMR) Committee reviews infant deaths due to perinatal conditions in Utah through a detailed case-review process. The PMR Committee is comprised of perinatal health care providers from the various health systems operating in Utah. The PMR Committee meets monthly to complete case reviews of infant and maternal deaths and to make recommendations for prevention based on the reviews.

In the years of this report, nine term OOH neonatal deaths were reviewed by the PMR Committee. Among these nine cases, six deliveries occurred in an OOH setting and three were transfers to a hospital. Three cases were associated with licensed midwives, five with unlicensed midwives, and one with someone other than a midwife. The PMR Committee believed five of the deaths had a strong chance of being prevented and four had some chance of being prevented (scale=none, some, good, strong).

• Recommendations of the PMR Committee on these deaths included the following:
  - OOH care providers should promptly recognize signs of fetal distress and respond with urgent transfer to the hospital.
  - When medical or pregnancy complications exist (such as diabetes, multiple gestation, non-vertex presentation, or previous cesarean delivery) obstetric or maternal-fetal medicine consultation should be strongly recommended to the pregnant woman by the care provider to ensure the woman is well counseled about the potential risks and benefits of delivering outside of the hospital.
  - Legislation defining medical and obstetric situations inappropriate for planned OOH birth due to unacceptable risk should be strongly considered as a means of decreasing maternal and neonatal morbidity and mortality.

Study Limitations

- This report uses vital statistics data collected by the Utah Office of Vital Records and Statistics (OVRS) and there are described limitations of vital statistics records. These include the inability to capture all maternal, neonatal and delivery characteristics and outcomes.
- Maternal transfer data is only available since 2014. The rate of transfer from OOH birth setting to hospital reported here, 6.6%, is likely under reported in this data. In an Oregon report on planned OOH birth that used a similar transfer variable, the transfer rate was noted to be 15.8%. (5) With any new variable, accurate documentation and capture is likely to improve over time.
- Rates of serious maternal and neonatal morbidity and mortality are low in all birth settings, and caution is necessary in interpreting and comparing these statistics.

Discussion

1) Interval Legislative Changes in Utah

a) House Bill (H.B.) 190, Nurse Midwife Practice Act Amendments, passed during the 2012 General Utah Legislative Session, removed the requirement for a physician signature on the intrapartum referral plan, thus eliminating barriers to practice for some Certified Nurse Midwives (CNM) who wanted to attend OOH births. It did not eliminate the requirement of a written plan outlining the guidelines for CNM consultation and referral to a physician when complications arise.

b) H.B. 184, Unlicensed Direct-entry Midwifery, passed during the 2016 General Utah Legislative Session. This bill requires unlicensed direct entry midwives (UDEMs) in Utah to obtain a statement of informed consent from all clients they serve, as is also required for licensed direct entry midwives. This informed consent document requires each woman seeking services from an unlicensed midwife in Utah to be informed that the UDEM is unlicensed in Utah; a description of midwifery training; a statement that the UDEM is not allowed to administer any medication except oxygen; a written plan to address medical issues that may arise during pregnancy, labor, or childbirth; and transfer plans.

c) S.B. 108, Birthing Center Amendments, passed during the 2016 General Utah Legislative Session. This legislation revised licensing regulations for birthing centers. In June 2016, the first birth

center received its license. There are now five licensed birth centers as of this publication date. The remaining centers have so far chosen to remain unlicensed.

2) Utah Women and Newborn Quality Collaborative (UWNQC)

a) Launched in 2013, the UWNQC is a statewide, multi-stakeholder network dedicated to improving maternal and neonatal health in Utah (www.health.utah.gov/uwnqc).

b) The OOH Birth Subcommittee was formed in order to identify maternal and neonatal safety issues related to OOH births and to create statewide action items and associated tools. The committee includes physicians, nurses, midwives (hospital, community-based, licensed, and unlicensed), and hospital and public health administrators.

c) A "Transfer Toolkit" was created with the intent of facilitating safe transfer from home or birth centers to hospitals, and includes:

- Maternal and neonatal transfer forms
  - Communication tools filled out by the transferring midwife
- Utah Best Practice Guidelines: Transfer to Hospital from Planned OOH Birth
  - Defines model practices for midwives, hospital providers and staff, and hospitals/hospital systems
- Transfer instructions
  - A form that is completed by individual hospitals in which they define their process for maternal and neonatal transfers
  - Completed hospital instruction sheets are posted on the UWNQC website
- Transfer feedback tool
  - Voluntary online survey to collect feedback on the transfer process from both hospital staff and midwives (https://www.surveymonkey.com/r/UWNQCTransferFeedbackSurvey)

Recommendations

Based on these findings and the perceived limitations of this report, the following are proposed:

1. **Triennial reports on planned OOH births** should continue to be published to update the data presented here, with focus on the maternal transfer variable introduced in 2014 (transfer from planned home birth to hospital) and on neonatal outcome statistics based on location of intended delivery.
2. The Utah Department of Health Perinatal Mortality Review Committee should **continue to review infant deaths** due to perinatal conditions in Utah through a detailed case-review process. Their findings and recommendations should continue to inform this analysis.
3. Hospitals and hospital systems should focus on strategies that **improve the documentation of maternal and neonatal transfers** from homes or birth centers. These may include admission history and physical templates with required fields addressing transfers. These efforts will improve data quality for maternal and neonatal transfers from homes and birth centers.
4. Hospital obstetric and neonatal providers and staff should **be familiar with all of the components in the UWNQC Transfer Toolkit and should follow best practices outlined therein**. This includes creation and publication of their hospital transfer algorithm on the UWNQC website.
5. Midwives should also be familiar with all of the components in the UWNQC **Transfer Toolkit** and should follow best practices outlined therein. This includes consistent use of the maternal and neonatal transfer forms to facilitate communication.
6. Midwives should **be familiar with all three components of newborn screening, follow state mandates,** and consistently utilize educational materials regarding the importance of newborn

screening for both providers and their clients. (http://health.utah.gov/cchd and http://health.utah.gov/newbornscreening and http://health.utahgov/ehdi)

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APPENDIX

Birthing Centers

Licensed Birthing Center:

A licensed birthing center is a stand-alone facility (OOH) that is regulated by Utah statue R432-550 under the authority of Utah Code Title 26-21. A facility is considered a birthing center under this rule if it consists of one to five birth rooms. This statute provides health and safety standards for the organization, maintenance and operation of birthing centers.

Unlicensed Birthing Center:

An unlicensed birthing center consists of only one birthing room and is not licensed in the state of Utah.

Health Care Providers of Maternity and Newborn Care

https://mihp.utah.gov/during-pregnancy/choosing-a-prenatal-care-provider

Utah Statutes

Out-of-Hospital Births:

Utah Code 58-77-304 pertains to parents' rights and states that "parents have the right to deliver their baby where, when, how, and with whom they choose, regardless of licensure." The code (58-77-501(2)(a)) also notes, it is lawful to practice direct-entry midwifery in the state without being licensed. Utah Code 58-77-102 provides authority for licensed direct entry midwifery practice. Utah Code 58-44a provides authority for certified nurse-midwifery practice. Utah Code R432-550 provides authority for Birth Centers in Utah.

Testing of Newborn Infants Utah Health Code Statute 26-10-6:

Mandates all three components of newborn screening with the following associated rules:

Critical Congenital Heart Defect (CCHD) Screening Rule R398-5:

Screening for Critical Congenital Heart Disease (CCHD) by pulse oximetry (POX) became mandatory for all newborns born in Utah on October 1, 2014. This screening should be completed when the newborn is between 24 to 48 hours old and reported through Birth Defect Reporting Rule 398-5.

Hearing Screening R398-2:

All Utah newborns are mandated to receive hearing screening before hospital discharge (or before 10 days of age if born OOH) and is best performed after 10-12 hours post-partum. If the newborn is born outside of a hospital, the person in attendance at the birth must arrange for the infant's hearing screening as required by this rule. Institutions or persons primarily responsible for births shall provide information about newborn hearing screening to parents and primary care providers of newborns.

Heel Stick Screening R438-15:

Two newborn screening specimens are collected on infants born in Utah, which test for 41 disorders. Currently Utah State Statute (Effective June 1, 2015) requires first screen collection between 24- 48 hours of life. Prior to June 1, 2015, collection time for the first screen was between 24 hours and 5 days of life. The second screen is completed between 7-28 days of age, usually at the two-week well-child check with the baby's health care provider. A parent or legal guardian may refuse to allow the required testing for religious reasons only. The medical home/practitioner or institution shall file in the newborn's record documentation of refusal, reason, education of family about the disorders, and a signed waiver by both parents or legal guardian.